

THE UNITED SHATES OF AMERICA

TO ALL TO WHOM THESE PRESENTS SHALL COME: ADSH Research Hundation

DEPOSE, THERE HAS BEEN PRESENTED TO THE

Secretary of Agriculture

AN APPLICATION REQUESTING A CERTIFICATE OF PROTECTION FOR AN ALLEGED DISTINCT VARIETY OF SEXUALLY REPRODUCED, OR TUBER PROPAGATED PLANT, THE NAME AND DESCRIPTION OF WHICH ARE CONTAINED IN THE APPLICATION AND EXHIBITS, A COPY OF WHICH IS HEREUNTO ANNEXED AND MADE A PART HEREOF, AND THE VARIOUS REQUIREMENTS OF LAW IN SUCH CASES MADE AND PROVIDED HAVE BEEN COMPLIED WITH, AND THE TITLE THERETO IS, FROM THE RECORDS OF THE PLANT VARIETY PROTECTION OFFICE, IN THE APPLICANT(S) INDICATED IN THE SAID COPY, AND WHEREAS, UPON DUE EXAMINATION MADE, THE SAID APPLICANT(S) IS (ARE) ADJUDGED TO BE ENTITLED TO A CERTIFICATE OF PLANT VARIETY PROTECTION UNDER THE LAW.

NOW, THEREFORE, THIS CERTIFICATE OF PLANT VARIETY PROTECTION IS TO GRANT UNTO THE SAID APPLICANT(S) AND THE SUCCESSORS, HEIRS OR ASSIGNS OF THE SAID APPLICANT(S) FOR THE TERM OF TWENTY YEARS FROM THE DATE OF THIS GRANT, SUBJECT TO THE PAYMENT OF THE REQUIRED FEES AND PERIODIC REPLEMENT OF VIABLE BASIC SEED OF THE VARIETY IN A PUBLIC REPOSITORY AS PROVIDED BY LAW, THE CHI TO EXCLUDE OTHERS FROM SELLING THE VARIETY, OR OFFERING IT FOR SALE, OR REPRODUCING IT, OR CONDITIONING IT FOR PROPAGATION, OR STOCKING IT FOR ANY OF THE EXPROSES, OR USING IT IN PRODUCING A HYBRID OR DIFFERENT VARIETY THEREFROM, TO THE EXTENT THE PLANT VARIETY PROTECTION ACT. (84 STAT. 1542, AS AMENDED, 7 U.S.C. 2321 ET SEQ.)

OAT

'Beach'

In Jestimonn Thereof, I have hereunto set my hand and caused the seal of the Hunt Buriety Protection Office to be affixed at the City of Washington, D.C. this seventh day of September, in the year two thousand and seven.

Allad.

Derzie

Commissioner Plant Variety Protection Office Agricultural Marketing Service

REPRODUCE LOCALLY. Include form number and de	ate on all reprodu	ections			Form Approved - OMB No. 0581-0055		
U.S. DEPARTMEN	NT OF AGRICULT	URE	The following statements are made in a	ccordanc	e with the Privacy Act of 1974 (5 U.S.C. 552a) and		
AGRICULTURAL N SCIENCE AND TECHNOLOGY - PI	MARKETING SER' LANT VARIETY PI	VICE ROTECTION OFFICE	the Paperwork Reduction Act (PRA) o				
APPLICATION FOR PLANT VAI (Instructions and information col					slant variety protection certificate is to be issued until certificate is issued (7 U.S.C. 2426).		
1. NAME OF OWNER			2. TEMPORARY DESIGNATION OR EXPERIMENTAL NAME	3. VA	RIETY NAME		
NDSU Research Foundation		ND951394	'Ве	ach'			
4. ADDRESS (Street and No., or R.F.D. No., City,	State, and ZIP Cod	de, and Country)	5. TELEPHONE (include area code)	╁──	FOR OFFICIAL USE ONLY		
C/O Executive Director			701-231-8931		NUMBER		
1735 NDSU Research Park Driv	ve		6. FAX (include area code)	2	16/11/11/14		
Fargo, ND 58105-5002			701-231-6661	<u> </u>	DATE		
7. IF THE OWNER NAMED IS NOT A "PERSON",	GIVE FORM OF	8. IF INCORPORATED, GIVE	9. DATE OF INCORPORATION		, 5.1.2		
ORGANIZATION (corporation, partnership, associated NDSU Research Foundation 501(c	ciation, etc.)	STATE OF INCORPORATION	May 1, 1989	hv.	VEMBER 28, 2006		
	o)(o) corp	ND	Way 1, 1969	$ N_0 $	NEW LAT COOL		
10. NAME AND ADDRESS OF OWNER REPRESE	NTATIVE(S) TO S	SERVE IN THIS APPLICATION. (First	person listed will receive all papers)	F E E	FILING AND EXAMINATION FEES:		
Michael McMullen		Dale Zetocha, Execu	utive Director	s	: 4,382.00		
Dept. of Plant Sciences		NDSU Research For	undation	R E C	CERTIFICATION FEE:		
NDSU P.O. Box 5051		1735 NDSU Researc	ch Park Drive	E	: 768,00		
Fargo, ND 58105-5051		P.O. Box 5002 Fargo, ND 58105-50	002	V E	DATE SALLIAS		
11. TELEPHONE (Include area code)	12. FAX (Include	<u></u>	13. E-MAIL	D	1/29/01		
701-231-8165	701-231-8		michael.mcmullen@	ndsu.	edu dzetocha@ndsurf.org		
14. CROP KIND (Common Name)	16. FAMILY NA		18. DOES THE VARIETY CONTA				
Oat		ae, Aveneae	☐ YEŞ ☑ NO	COLONEO	USDA-APHIS REFERENCE NUMBER FOR THE		
15. GENUS AND SPECIES NAME OF CROP Avena sativa		RIETY A FIRST GENERATION HYBR	APPROVED PETITION TO D		ATE THE GENETICALLY MODIFIED PLANT FOR		
19. CHECK APPROPRIATE BOX FOR EACH ATTA		<u> </u>	COMMERICALIZATION. 2D. DOES THE OWNER SPECIFY THAT SEED OF THIS VARIETY BE SOLD AS A CLASS				
(Follow instructions on reverse)			OF CERTIFIED SEED? (See Section 83(a) of the Plant Variety Protection Act)				
 a.	of the Variety		☐ YES (If 'yes', answer items 21 and 22 below) ✓ NO (If 'no', go to item 23) 21. DOES THE OWNER SPECIFY THAT SEED OF THIS VARIETY BE LIMITED AS TO				
 b. M Exhibit B. Statement of Distinctness c. M Exhibit C. Objective Description of Variance 	etv		NUMBER OF CLASSES? ☐ YES ☐ NO				
d. M Exhibit D. Additional Description of the			_ '' =	П ғош	NDATION REGISTERED CERTIFIED		
e. 🖼 Exhibit E. Statement of the Basis of the		nip	22. DOES THE OWNER SPECIFY THAT SEED OF THIS VARIETY BE LIMITED AS TO NUMBER OF GENERATIONS?				
f. 📝 Exhibit F. Declaration Regarding Depos	sit		YES ANO				
g. Voucher Sample (3,000 viable untreate that tissue culture will be deposited and			IF YES, SPECIFY THE NUMBER 1,2,3, etc. FOR EACH CLASS.				
g. 🕡 Filing and Examination Fee (\$4,382), m	ade payable to "Tr	., , , , ,,	☐ FOUNDATION ☐ RE	GISTERE	D CERTIFIED		
States" (Mail to the Plant Variety Protect 23. HAS THE VARIETY (INCLUDING ANY HARVES	•	OR A HYBRID PRODUCED		• • •	lease use the space indicated on the reverse.) IT OF THE VARIETY PROTECTED BY		
FROM THIS VARIETY BEEN SOLD, DISPOSED OTHER COUNTRIES?	OF, TRANSFERF	RED, OR USED IN THE U.S. OR			PLANT BREEDER'S RIGHT OR PATENT)?		
Ø YES □ NO			☐ YES ZZ NO				
IF YES, YOU MUST PROVIDE THE DATE OF F FOR EACH COUNTRY AND THE CIRCUMSTAI	FIRST SALE, DISP NCES. (Please us	OSITION, TRANSFER, OR USE se space indicated on reverse.)	IF YES, PLEASE GIVE COUN' REFERENCE NUMBER. (Plea		E OF FILING OR ISSUANCE AND ASSIGNED lack indicated on reverse.)		
25. The owners declare that a viable sample of basis for a tuber propagated variety a tissue culture w	c seed of the varie	ty has been furnished with application a public repository and maintained for	n and will be replenished upon request in ac or the duration of the certificate.	cordance	with such regulations as may be applicable, or		
The undersigned owner(s) is(are) the owner of the	nis sexually reprod	uced or tuber propagated plant variet		inct, unifo	orm, and stable as required in Section 42, and is		
entitled to protection under the provisions of Sections Owner(s) is (are) informed that false representations		•	ies.				
SIGNATURE OF OWNER			SIGNATURE OF OWNER				
Dale Betocha	,						
NAME (Please print or type)			NAME (Please print or type)				
Dale Zetocha							
CAPACITY OR TITLE Executive Director	DATE	11/22/16	CAPACITY OR TITLE	DATE			

See reverse for instructions and information collection burden statement)

GENERAL INSTRUCTIONS: To be effectively filed with the Plant Variety Protection Office (PVPO), ALL of the following items must be received in the PVPO: (1) Completed application form signed by the owner; (2) completed exhibits A, B, C, E, F; (3) for a tuber reproduced variety, verification that a viable (in the sense that it will reproduce an entire plant) tissue culture will be deposited and maintained in an approved public repository; and (4) payment by credit card or check drawn on a U.S. bank for \$4,382 (\$518 filling fee and \$3,864 examination fee), payable to "Treasurer of the United States" (See Section 97.6 of the Regulations and Rules of Practice). NEW: With the application for a seed reproduced variety or by direct deposit soon after filling, the applicant must provide at least 3,000 viable untreated seeds of the variety per se, and for a hybrid variety at least 3,000 untreated seeds of each line necessary to reproduce the variety. Partial applications will be held in the PVPO for not more than 90 days; then returned to the applicant as un-filed. Mail application and other requirements to Plant Variety Protection Office, AMS, USDA, Room 401, NAL Building, 10301 Baltimore Avenue, Beltsville, MD 20705-2351. Retain one copy for your files. All items on the face of the application are self explanatory unless noted below. Corrections on the application form and exhibits must be initialed and dated. DO NOT use masking materials to make corrections. If a certificate is allowed, you will be requested to send a payment by credit card or check payable to "Treasurer of the United States" in the amount of \$768 for issuance of the certificate. Certificates will be issued to owner, not licensee or agent.

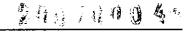
NOTES: It is the responsibility of the applicant/owner to keep the PVPO informed of any changes of address or change of ownership or assignment or owner's representative during the life of the application/certificate. The fees for filing a change of address; owner's representative; ownership or assignment; or any modification of owner's name is specified in Section 97.175 of the regulations. (See Section 101 of the Act, and Sections 97.130, 97.131, 97.175(h) of the Regulations and Rules of Practice.)

Plant Variety Protection Office

Telephone: (301) 504-5518

FAX: (301) 504-5291

General E-mail: PVPOmail@usda.gov Homepage: http://www.ams.usda.gov/science/pvpo/PVPindex.htm



SPECIFIC INSTRUCTIONS:

To avoid conflict with other variety names in use, the applicant must check the appropriate recognized authority and **provide evidence** that the permanent name of the application variety (even if it is a parental, inbred line) has been cleared by the appropriate recognized authority before the Certificate of Protection is issued. For example, for agricultural and vegetable crops, contact: U.S. Department of Agriculture, Agricultural Marketing Service, Livestock and Seed Programs, **Seed Regulatory and Testing Branch**, 801 Summit Crossing Place, Suite C, Gastonia, North Carolina 28054-2193 Telephone: (704) 810-8870. http://www.ams.usda.gov/lsg/seed.htm.

ITEM

19a. Give:

- (1) the genealogy, including public and commercial varieties, lines, or clones used, and the breeding method;
- (2) the details of subsequent stages of selection and multiplication;
- (3) evidence of uniformity and stability; and
- (4) the type and frequency of variants during reproduction and multiplication and state how these variants may be identified
- 19b. Give a summary of the variety's distinctness. Clearly state how this application variety may be distinguished from all other varieties in the same crop. If the new variety is most similar to one variety or a group of related varieties:
 - (1) identify these varieties and state all differences objectively;
 - (2) attach replicated statistical data for characters expressed numerically and demonstrate that these are clear differences; and
 - (3) submit, if helpful, seed and plant specimens or photographs (prints) of seed and plant comparisons which clearly indicate distinctness.

19c. Exhibit C forms are available from the PVPO Office for most crops; specify crop kind. Fill in Exhibit C (Objective Description of Variety) form as completely as possible to describe your variety.

- 19d. Optional additional characteristics and/or photographs. Describe any additional characteristics that cannot be accurately conveyed in Exhibit C. Use comparative varieties as is necessary to reveal more accurately the characteristics that are difficult to describe, such as plant habit, plant color, disease resistance, etc.
- 19e. Section 52(5) of the Act requires applicants to furnish a statement of the basis of the applicant's ownership. An Exhibit E form is available from the PVPO.
- 20. If "Yes" is specified (seed of this variety be sold by variety name only, as a class of certified seed), the applicant MAY NOT reverse this affirmative decision after the variety has been sold and so labeled, the decision published, or the certificate issued. However, if "No" has been specified, the applicant may change the choice. (See Regulations and Rules of Practice, Section 97.103).
- 23. See Sections 41, 42, and 43 of the Act and Section 97.5 of the regulations for eligibility requirements.
- 24. See Section 55 of the Act for instructions on claiming the benefit of an earlier filing date.
- 22. CONTINUED FROM FRONT (Please provide a statement as to the limitation and sequence of generations that may be certified.)

23. CONTINUED FROM FRONT (Please provide the date of first sale, disposition, transfer, or use for each country and the circumstances, if the variety (including any harvested material) or a hybrid produced from this variety has been sold, disposed of, transferred, or used in the U.S. or other countries.)

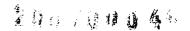
'Beach' was distributed to the North Dakota Crop Improvement Association under contract for seed increase. The first certified seed tag to a crop improvement grower was issued January 9, 2006. 'Beach' was first evaluated under a Material Transfer Agreement in Canada, March 21, 2005. Material Transfer Agreements were used since as well and were for testing and evaluation only. No seed sales were authorized.

24. CONTINUED FROM FRONT (Please give the country, date of filing or issuance, and assigned reference number, if the variety or any component of the variety is protected by intellectual property right (Plant Breeder's Right or Patent).)

According to the Paperwork Reduction Act of 1995, an agency may not conduct or sponsor, and a person is not required to respond to a collection of information unless it displays a valid OMB control number. The valid OMB control number for this information collection is 0581-0055. The time required to complete this information collection is estimated to average 1.4 hours per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information.

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To file a complaint of discrimination, write to USDA, Director, Office of Civil Rights, 1400 Independence Avenue, S.W., Washington, D.C. 20250-9410, or call (800) 795-3272 (voice) or (202) 720-6382 (TDD). USDA is an equal opportunity provider and employer.



Pedigree

Beach was developed with the pedigree ND891126/ND914832

ND891126 = ND850474/ND861383

ND850474 = ND810677/'DUMONT'

ND810677 = RPB120-73/RL3038//M22/'Kelsey'

M22 = 'Avon'//'Rodney'/'Milford'

RL 3038 was provided by R. McKenzie, Agriculture and Agrifood Canada, possesses genes *Pc-38*, *Pc-39*, *Pg-2*, and *Pg-13* and was derived from a complex pedigree that included 'Rodney' and 'Pendek'

ND861383 = 'Valley'/'Dumont'

ND914832 = ND863437/IL81-2570

ND863437 = W80-19/SO81136

W80-19 = Germplasm line with unknown parentage received from Agriculture and Agri-food Canada, Winnipeg that possessed crown rust resistance genes Pc-55 and Pc-56.

SO81136 = 'Otana'/'Cascade'

IL81-2570 = IL75-1062/P 7135A1-1-8-4

IL75-1062 = 'Coker-227'//'Clintford'/'Portal'

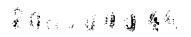
P 7135A1-1-8-4 =

(CI 7684-Putnam-Albion) Sel./'Allen'//'Noble'/'Stout'

SO81136 = Otana/Cascade

ND863384 = SD800043/W80-19 SD800043 = 'Noble'//'Dal'/'Nodaway 70'

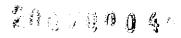
Experimental Designation ND951394



Breeding Method –

Modified single seed descent and pedigree method

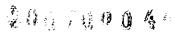
Selection and Multiplication –	Stage of development	Selection Criteria
1991 Fall greenhouse	Final cross	
1992 Spring greenhouse	F ₁	F ₁ plants were uniform and seed from 3 plants was bulked to produce F ₂ population
1992 Field	F ₂ selection of single panicle	F ₂ population was segregating for crown rust and stem rust resistance in the field. Plants exhibiting multiflorous naked seeded phenotype and resistant to both stem rust and stem rust were selected for advancement.
1992 Fall greenhouse	F ₃ single seed descent accompanied by screening for seedling resistance to critical races of stem and crown rust.	Seedlings were inoculated with composite of crown rust races that were virulent on Pc-38 and Pc-39 and with stem rust race NA27. Seedlings exhibiting a resistant infection type were grown to maturity and seed from individual resistant F ₃ plants that exhibited the naked seed characteristic were advanced to the field.
1993 Field	F ₄ planted in hill plots from seed of single F _{3:4} panicle F ₄ panicles harvested from selected hill plots	Panicles from plants in hill plots exhibiting the naked seed characteristic, stem rust and crown rust resistance, along with resistance to lodging and tolerance to barley yellow dwarf virus were harvested to provide seed for advancement to the F ₅ .



Breeding Method -

Modified single seed descent and pedigree method

Selection and Multiplication –	Stage of development	Selection Criteria
1994 Field	Seed from F ₄ panicles were planted to produce paired hill plots. A selected paired hill plot was harvested in bulk to produce an F _{4:5} breeding line that was subsequently designated ND951394 that became the source of Beach breeder's seed.	Hill plots exhibiting homogeneity of crown rust resistance and stem rust resistance were selected for harvest. Lodging resistance, expression of the naked seed characteristic, and visual selection of kernel morphology were considered to further select plots that were identified for harvest. Harvested lines were evaluated as seedlings in the greenhouse using stem rust race NA27 and a composite of crown rust races to identify lines homogeneous for resistance to these diseases. These selected lines were advanced to the F ₆ generation.
1995 Field	F ₆ Preliminary screening trial – Fargo location, one replication with repeating checks.	Selection was based on lodging resistance, medium heading date, high grain yield, high test weight, expression of naked seed characteristic, and resistance to stem and crown rust in the field. Stem rust and crown rust seedling resistance evaluation was repeated in the greenhouse to identify homogeneous resistant lines.
1996 Field	F7 Preliminary Yield Trial (PYT) – Two ND locations, two replications per location ND951394 assigned to line.	Selection was based on lodging resistance, medium heading date, high grain yield, high test weight, and resistance to stem and crown rust in the field. Seedling stem and crown rust.



Breeding Method -

Modified single seed descent and pedigree method

Selection and Multiplication –	Stage of development	Selection Criteria
1997 Field	F ₈ Early Advanced Yield Trial (EAYT), 4 ND locations with 3 replications per location.	Evaluation was based on lodging resistance, medium heading date, high grain yield, high test weight, groat percentage, low proportion of kernels passing through a 5/64" sieve, and resistance to stem and crown rust in the field. Stem rust and crown rust seedling resistance was evaluated in the greenhouse.
1998 Field	F ₉ Tri-State Oat Nursery grown at ten locations across ND, SD, and MN with replication at each location. Drill-strip increase plot planted for seed increase and purification. Variants were removed.	ND951394 that became Beach was determined to produce high grain yield and high test weight. Stem rust and crown rust resistance evaluation at many locations indicated ND951394 had stable resistance to stem rust race NA27, but is susceptible to NA67. Stem rust and crown rust seedling resistance evaluation was repeated in the greenhouse.

Breeding Method -

Modified single seed descent and pedigree method

Selection and Multiplication –	Stage of development	Selection Criteria
1999 ND Field	F ₁₀ NDOVT at 10 locations and Uniform Midseason Oat Performance Nursery at 21 locations Increase and purification in drill strip at Fargo	ND951394 that became Beach was determined to produce high grain yield, medium high test weight, and More than 99% naked seed Stem rust and crown rust resistance was evaluated at many locations and ND951394 was identified to have moderate crown rust resistance and resistance to stem rust race NA27, but issusceptible to stem rust race
2000 Field	F ₁₁ NDOVT at 10 locations and UMOPN at 20 locations Increase and purification in drill strip at Fargo.	NA67. Evaluation continued for all characteristics evaluated in 1999.
2001 Field	F ₁₂ NDOVT	Evaluation continued for all characteristics evaluated in 2000
2002 Field	F ₁₃ NDOVT 10 locations	Evaluation continued for all characteristics evaluated in 2001
2003 Field	F ₁₄ NDOVT 10 locations Preliminary large increase by Foundation Seed Stocks form F ₁₃ Breeder's Seed	Evaluation continued for all characteristics evaluated in 2002
2004 Field	F ₁₅ NDOVT 10 locations Foundation seed increase and release as Beach	Evaluation continued for all characteristics evaluated in 2003

Evidence of uniformity and stability:

Beach has been observed to be uniform and stable for stem rust resistance and crown rust resistance for ten generations from the original $F_{4:5}$ that was designated ND951395 in 1995 until release in 2004. Beach may produce tall variants (10 cm taller than the bulk of the population) that comprise less than 1% of the plants under some environmental conditions. The frequency of these variants has not changed for ten generations since they were observed in the F_8 generation in 1997. Beach appears otherwise unform and stable.

The type and frequency of variants during reproduction and multiplication and how these variants may be identified:

The tall variants comprise less than 1% of the Beach plants. The tall variants are conspicuous in environments where they are expressed..

18B. Exhibit B. Novelty Statement.

'Beach' is a tall late spring oat with white lemma and palea that is most similar to 'Otana' and 'Morton' in appearance. Morton is resistant to most races of crown rust present in North Dakota (ND), while Otana is considered susceptible to most crown rust isolates. Morton possesses crown rust resistance derived from IA B605X (temporary designation of resistance gene is Pc-IAB) that confers resistance to most races of crown rust prevalent in North Dakota as indicated by field reactions and by seedling reaction (Exhibit D, Tables 7 and 8) to critical crown rust pathotypes. Beach does not express a high level of resistance to the new crown rust races prevalent in ND since the new races are virulent on crown rust resistance genes Pc-38 and Pc-39 that are present in Beach as indicated by a fleck (;) seedling reaction when inoculated with CR13 and Cr36 (Table 8). Beach produces a infection type 3 or 4 when inoculated with pathotypes virulent on Pc-38 and Pc-39. Beach produces a moderately resistant to moderately resistant (MR-MS) reaction to crown rust in the field in ND (Table 7) while Otana produces a susceptible reaction and Morton produced a resistant reaction when crown rust infection was present on Morton in the field. Otana lacks Pc-IAB, Pc-38, and Pc-39 and is consequently susceptible to all four of the critical pathotypes used (Table 8). Beach and Morton possess resistance to stem rust race NA27 conferred by Pg-13 that produces an IT 2 when seedlings are inoculated with this race (Exhibit D, Table 6). Resistance to stem rust race NA27 conferred by Pg-13 distinguishes Beach and Morton from other USA cultivars with white hulls. Otana lacks Pg-13 and is susceptible to stem rust race NA27.

Form Approved OMB NO 0581-0055

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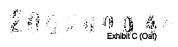
U.S. DEPARTMENT OF AGRICULTURE AGRICULTURAL MARKETING SERVICE SCIENCE AND TECHNOLOGY PLANT VARIETY PROTECTION OFFICE BELTSVILLE, MD 20705 Exhibit C

OBJECTIVE DESCRIPTION OF VARIETY Oat (Avena spp.)

NAME OF APPLICANT (S)	TEMPORARY OR EXPERIMENTAL DESIGNATION	VARIETY NAME
	ND 951394	Beach
ADDRESS (Street and No. or RD No., City, State, Zip Code, and Country)		PVPO NUMBER
	etal character of this variety in the boxes below. Place ther 99 or less or 9 or less.	e a zero in the first box
1. SPECIES: 1 = Sativa 2 = Byzantina 3	= Other (Specify)	
2. GROWTH HABIT: 3 1 = Winter 2 = Semi-Winter 3 Juvenile Growth: 1 = Prostrate	3 = Spring 2 = Semi-Prostrate 3 = Erect	
Same as Check * Mo * Mo * Hy Season: 1 = Very Ea	rton test riy (Jaycee) 2 = Early (Nodaway 70) 3 = Midseasor di) 5 = Very Late (Gerry) 6 = Extremely Late (Mack	n (Clintford) dinaw)
4. PLANT HEIGHT: (From Soil Level to Top of Head Com Tall	rton F1 Idear	

^{*} Relative to a Commercial Variety Grown in the Same Trial

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5.	STEM:	Diameter: 1 = Fine (Kherson) 2 = Medium (Clintford) 3 = Coarse (Nodaway 70) Hairiness at Upper Culm Nodes: 1 = Hairless 2 = Hairy
	Ш	Mature Stem Color 1 = Yellow 2 = Reddish
6.		eaf Color: The Royal Horticultural Society's or any recognized color chart should be used to determine the leaf color of the described wriety.) Carriage: 1 = Drooping (Random) 2 = Erect (Walken) Color: 1 = Yellow Green 2 = Light Green 3 = Dark Green 4 = Blue Green mm Width (First leaf below flag leaf) Leaf Margin: 1 = Glabrous 2 = Ciliate Ligule: 1 = Absent 2 = Present Leaf Sheath: 1 = Hairless 2 = Hairy
7.	HEAD:	
		Panicle Shape: 1 = Equilateral 2 = Intermediate 3 = Side Panicle (Unilateral) Attachment of Lower Whorl of Branches: 1 = First Node 2 = Second Node (False Node) Panicle Size: 1 = Samll (Yancey) 2 = Medium (Walken) 3 = Large (Markton) Panicle Width: 1 = Narrow (Gopher) 2 = Midbroad (Yancy) 3 = Broad (Nodaway 70) cm Panicle Length
8.	RACHIS:	
	2	1 = Recurved (Yancey) 2 = Erect (Walken) mm Second Floret Rachilla Segment Length Second Floret Rachilla Segment: 1 = Hairless 2 = Hairy Rachilla Hairs: 1 = Short 2 = Long
9.	SPIKELE	iT:
	3	Spikelet Separation by: 1 = Abscission 2 = Semi-Abscission 3 = Fracture
	2	Floret Separation by: 1= Disarticulation 2 = Heterofracture 3 = Basifracture
	7.8	Florets per Spikelet (Mean no.)
		· · · · · · · · · · · · · · · · · · ·
10.	GLUMES	 Glume Color: The Royal Horticultural Society's or any recognized color chart should be used to determine the leaf color of the described variety.)
		mm Width No. of Veins on Glumes Color: 1 = White 2 = Yellow
	•	3 = Red 4 = Striped
11.	LEMMA	: (Lemma Color: The Royal Horticultural Society's or any recognized color chart should be used to determine the leaf color of the
	14	described variety.) mm Length Color: 1 = White 2 = Yellow 3 = Red
		4 = Gray 5 = Black
	بب	Hairiness of Dorsal Surface: 1 = Hairless 2 = Hairy
12.	AWN: (Fi	rst Floret)
		Occurrence: 1 = Absent (Walken) 2 = Infrequent (Yancey) 3 = Common (Chilocco) 4 = Frequent (Random) Type: 1 = Non-twisted 2 = Twisted 3 = Twisted Geniculate mm Awn Length



	Florescence Under Ultrav Basal Hair:	-	2 = Non-florescent
щ		1 = Absent (Florida 501) 4 = Several to Numerous (Florilee)	2 = Absent to Few (Yancey) 3 = Few to Several (Lee) 5 = Numerous (Red Rustproof)
	7		
• • •	」 mm Basal Hair Length ເດື		.
ज्ञियाः	gms per 1000 Seeds	36	mg Groat Weight (Each)
10	. Groat Protein	17.9	% Groat Oil
MORCE	0. (0 - N-4 T 4 4 - 0		
<u> </u>	S: (0 = Not Tested 1 = Sus		
	Cereal Leaf Beetle	D Bluegrass Billbug D G	rain Bug (C. Sayi) 🔃 Nematode (Type)
0 (Green Bug (Biotype)		Other (Specify)
DISEAS	E: (0 = Not Tested 1 = Susc	ceptible 2 = Resistant)	
	Halo Blight 🔘 i	Powdery Mildew	a Leaf Blotch Soil-Borne Mosaic
O I	Helminthosporium	Yellow Dwarf Virus	Blight Other (Specify)
	Leaf Blotch		
	Specify Races Tested:	Races Susceptible	Races Resistant
I	Crown Rust	CR 192	CR13, CR181, CR185, CR 223, CR225
	Stem Rust	NA67	MASSAU, TEAN, JEAN, BAN, BAN
0	Covered Smut	771101	The state of the s
ĬΪ			MN. WPG
	Loose Smut		/V(N , VO L O

CHARACTER	VARIETY	CHARACTER	VARIETY
Plant Tillering	Morton_	Leaf Color	HIFI
Leaf Size	Morton	Leaf Carriage	Morton
Seed Color	Morton	Seed Shape	Dumont

COMMENTS:

Table 1.

Performance of Beach compared to selected lines in 2000-2003 North Dakota Oat Variety Trial 2000-2003.

				Thin	Whole				Ŧ .	
	Grain	Test	%	Kernels	Oat	Head	Plant	Lodge	Kernel	Groat
Cultivar	Yield	Wt.	Groat	<5/64"	Protein	>May 31	Height	Score	Wt.	Lipid
	bu/a	lb/bu	%	Proportion	%	Days	cm	0-5	mg	%
AC Assiniboia	118.7	35.4	75.0	0.08	14.9	32.3	103	1.2	38.5	8.8
Ebeltoft	122.3	34.6	73.4	0.11	14.3	33.2	96	1.8	37.0	8.3
HiFi	120.9	36.5	73.6	0.18	14.3	30.5	106	1.7	33.8	8.6
Hytest	95.7	39.4	76.2	0.08	18.0	26.6	111	2.8	35.3	7.8
Jerry	109.4	37.4	73.6	0.11	15.5	27.0	108	1.2	34.3	7.4
Kaufman AC						30.9			40.3	
Killdeer	126.3	35.2	74.2	0.11	13.2	29.3	95	2.4	33.8	7.8
AC Medaliion	115.9	35.5	75.2	0.10	13.9	31.8	107	3.0	36.8	9.3
Morton	118.6	37.4	73.1	0.10	15.3	29.9	114	0.9	33.8	7.3
Otana	107.3	33.8	70.7	0.19	13.6	31.4	110	3.1	30.0	8.0
Paul	86.0	41.8	91.0	0.56	20.3	32.3	108	2.2	23.5	11.0
Youngs	117.5	34.8	74.7	0.08	15.3	31.3	113	2.4	39.0	8.5
Beach	122.0	38.0	75.3	0.10	14.4	29.6	111	0.9	34.8	9.6
Loc. Yrs.	33	33	32	31	30	6	4	4	4	4

Table 2
North Dakota Oat Variety Trial 2000-2003 grain yield and test weight summary.

		Grain Yield				Test Weight				
	2003	2002-03	2001-03	2000-03	2003	2002-03	2001-03	2000-03		
	9 Loc.	2 yr.	3 yr.	4 yr.	9 Loc.	2 yr.	3 уг.	4 уг.		
Cultivar	Mean	Mean	Mean	Mean	Mean	Mean	Mean	Mean		
		bushhel	s/acre			lb/bu	shel			
AC Assinibola	126	105.5	114.2	118.7	36.2	35.0	34.5	35.4		
Ebeltoft	134	110.7	118.1	122.3	35.3	34.4	33.8	34.6		
HiFi	132	108.8	116.9	120.9	37.1	35.9	35.8	36.5		
Hytest	109	91.0	95.9	95.7	40.4	39.4	39.0	39.4		
Jerry	126	103.7	109.1	109.4	39.0	37.8	37.2	37.4		
AC Kaufman	127			-	37.0					
Killdeer	145	118.0	123.0	126.3	36.2	35.2	34.5	35.2		
AC Medallion	127	102.2	112.4	115.9	36.7	35.6	35.1	35.5		
Morton	131	1 <u>0</u> 7.0	117.6	118.6	37.9	37.0	36.9	37.4		
Otana	124	104.2	107.4	107.3	35.2	34.6	33.6	33.8		
AC Pinnacle	135				35.6					
Reeves	97			***	39.2					
AC Ronald	129				38.3					
Youngs	136	110.2	116.0	117.5	35.9	34.7	33.9	34.8		
Beach	135	111.2	118.5	122.0	39.2	38.0	37.4	38.0		
Loc. Yrs.	10	16	24.0	33	9.0	14.0	24.0	34.0		

Table 3
North Dakota Oat Variety Trial 2000-2003 thin oat proportion summary.

restri Bakota Cat variety Thai 2000-2000 thin oat proportion summary.							
	2000	2001	2002	2003	2002-03	2001-03	2000-03
1	9 Loc.	6 Loc.	8 Loc.	8 Loc	2 yr.	3 yr.	4 yr.
Cultivar	Mean	Mean	Mean	Mean	Mean	Mean	mean
			Proportion	through 5/0	34" sieve -		
AC Assiniboia	0.04	0.08	0.12	0.07	0.10	0.09	0.08
Ebeltoft	0.07	0.07	0.17	0.13	0.15	0.13	0.11
HiFi	0.11	0.17	0.27	0.18	0.23	0.21	0.18
Hytest	0.05	0.07	0.13	0.07	0.10	0.09	0.08
Jerry	0.08	0.10	0.16	0.09	0.13	0.12	0.11
AC Kaufman				0.05			
Killdeer	0.07	0.11	0.15	0.10	0.13	0.12	0.11
AC Medallion	0.06	0.09	0.16	0.11	0.13	0.12	0.10
Morton	0.06	0.07	0.17	0.12	0.13	0.12	0.10
Otana	0.14	0.16	0.25	0.20	0.21	0.21	0.19
AC Pinnacle				0.07			
Reeves				0.11			
AC Ronald				0.16			
Youngs	0.05	0.08	0.11	0.09	0.10	0.10	0.08
Beach	0.06	0.09	0.14	0.11	0.12	0.11	0.10
Loc. Yrs.	9	6	8	8	16	22	31

North Dakota Oat Variety Trial 2000-2002 Groat Percentage Summary.

HOILI BUILDIA GAL	North Dakota Cat Vallety Mai 2000-2002 Gloat Percentage Summary.									
	2000	2001	2002	2003	2002-03	2001-03	2000-03			
	9 Loc.	6 Loc.	8 Loc.	9 Loc.	2 yr.	3 yr.	4 уг.			
Cultivar	Mean	Mean	Mean	Mean	Mean	Mean	mean			
	Groat Percentage									
AC Assiniboia	76.7	76.2	77.8	70.0	73.7	74.3	75.0			
Ebeltoft	74.3	70.8	74.5	73.3	73.9	73.1	73.4			
HiFi	74.7	72.7	73.6	73.0	73.3	73.1	73.6			
Hytest	77.0	74.8	76.5	75.9	76.2	75.8	76.2			
Jerry	75.3	70.2	73.9	73.7	73.8	72.9	73.6			
AC Kaufman				77.6	-					
Killdeer	76.0	71.3	74.5	74.0	74.2	73.5	74.2			
AC Medallion	75.7	74.3	76.0	74.8	75.3	75.1	75.2			
Morton	73.0	73.3	73.6	72.6	73.1	73 <u>.</u> 1	73.1			
Otana	74.0	67.2	71.6	68.9	70.2	69.4	70.7			
Paul	89.0	89.5	91.3	93.8	92.6	91.8	91.0			
AC Pinnacle				74.6						
Reeves				74.8						
AC Ronald				75.7						
Youngs	74.3	73.2	75.9	74.9	75.4	74.8	74.7			
Beach	75.3	75.3	76.1	74.5	75.2	75.3	75.3			
Loc. Yrs.	9	6	8	9	17	23	32			

Table 5 2000-2003 ND Oat Variety Trial Whole Oat Protein Summary

-	2000	2001	2002	2003	2002-03	2001-03	2000-03
	7 Loc	6 Loc	8 Loc.	9 Loc	2 yr.	3 yr.	4 yr.
Cultivar	Mean	Mean	Mean	Mean	Mean	Mean	mean
·				%			
AC Assiniboia	14.5	14.3	14.7	15.9	15.3	15.1	14.9
EBELTOFT	14.6	13.3	14.7	14.3	14.4	14.1	14.3
HiFi	13.8	14.0	14.4	14.8	14.6	14.5	14.3
HYTEST	17.9	17.7	18.3	17.9	18.1	18.0	18.0
JERRY	15.7	14.5	15.8	15.9	15.8	15.5	15.5
Kaufman AC				13.3			
KILLDEER	13.8	12.0	13.3	13.5	13.4	13.0	13.2
ACMEDALLION	14.0	12.9	14.5	14.2	14.3	13.9	13.9
Morton	15.5	14.9	15.4	15.4	15.4	15.3	15.3
OTANA	13.8	12.9	13.7	13.9	13.8	13.6	13.6
PAUL	21.3	18.5	21.3	19.9	20.6	20.0	20.3
Pinnacle AC				12.9			
Reeves				17.1			
Ronald AC				15.0			
YOUNGS	15.2	14.4	15.9	15.4	15.6	15.3	15.3
Beach	14.5	13.6	14.8	14.5	14.7	14.4	14.4
Loc. Yrs.	7	6	8	9	17	23	30

Table 6. 2000-2003 Oat stem rust evaluation of cultivars similar to Beach.

	F	Fargo Field 2002			Green House Seedling Evaluation				ıation
	Yie	ld Plot	Hill	Hill	2000	2001	20	002	2003
Cultivar_	Rep 1	Rep 2	Plot	Plot	NA67	NA67	NA67	NA27	NA67
		% Se	ev			Infec	tion Ty	oe	
AC Assiniboia	TS	20S	MS	80S	4	4	4	2	4
EBELTOFT	5S	TS	MR-MS	20\$		· ·	4	2	4
HiFi	5MR-S	5MR-MS	MR-MS	20S	?	;	3	1	2
HYTEST	60S	208	S	60S	3		4	4	4
JERRY	5S	108	S	60S	3		4	2	4
AC Kaufman				60S					4
KILLDEER	5MR	108	MS		4		4	1	4
AC MEDALLION	108	5MR-S	S	80S	4	4	4	1	4
Morton	5S	5S	MS	80S	4	4	4	2	4
OTANA	60\$	60\$	S	80S	4		4	4	4
YOUNGS	5MR-MS	10R-MS	MR-MS	60S	4		4	1	4
Beach	60S	208	MR-MS	60S	3		4	2	4

Table 7. 2000-2003 Oat crown rust evaluation

	Fargo Field Results				Greenhouse Seedling Evaluations				
	2000	2002	20	003	2000	2001	20	02	2003
Cultivar	Yield Plot	Yield Plot	YieldPlot	Hill Plot	Composite	Comp.	Comp	Comp+	Comp
% Severity						Infec	ction Typ	e	
AC Assiniboia	OR		0R	10MS	;	;	;/1-4	;	;
EBELTOFT	20MR-MS		10MR-MS	40MR-MS	;/3-3?	4	4	3	4
HiFi	OR		0R	0R	;/2-2	;/1 -4	;/1-3	;/1-3	;
HYTEST	40MS		20MR-MS	60S	3	3	4	3	4
JERRY	60MS	20MR-MS	20MR-MS	60\$	3	4	4	3	4
AC Kaufman			0R	0R					;
KILLDEER	40MR-MS	40MS	60S	60S_	3	4	4	3	3
Loyal	OR		TR-MR	10MR-MS	3	2	2	3	3
AC MEDALLION	OR		0R	0R		- 1	,	•	;
Monida	100S	100S	60S	808	4	4	4	4	4
Morton	OR		0R	0R	;	1	•	:	_ ;C
OTANA	100S	808	7/4 80S	1008	3	4	4	4	4
PAUL	10MR-MS		5MS	20MR	4	4	4	4	_ 4
YOUNGS	40MR-MS		208	40MS	4	4	4	3	4
Beach	20MR	20MS	10MR-MS	20MR-MS	2	4	4	3	3

Table 8. Seedling crown rust infection type resulting from inoculation with critical pathotypes.

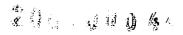
	Pathotype of Crown Rust Inoculum					
Cultivar	CR13	CR36	CR254	NDCRM	NDCRA	
			Infection	Туре		
Assiniboia	1	÷	4	;	4	
EBELTOFT	. ,	1	4	4	4	
HiFi	;	_;	;	,	;	
HYTEST	3	4	4	4	4	
JERRY	· 1		4	4	4	
AC Kaufman	;	•	4	;	4	
KILLDEER			4	4	4	
Loyal	3	3	4	2	2	
AC MEDALLION	;	;	4	;	4	
Monida	4	4	4	4	4	
Morton	;	;	4	4	;	
OTANA	3	4	4	4	4	
YOUNGS	;	;	4	4	4	
Beach	i	;	4	4	3	

REPRODUCE LOCALLY. Include form number and edition date on all	reproductions.	ORM APPROVED - OMB No. 0581-0055			
U.S. DEPARTMENT OF AGRICULTURE AGRICULTURAL MARKETING SERVICE EXHIBIT E STATEMENT OF THE BASIS OF OWNERSHIP	Application is required in order to determine if a plant variety protection certificate is to be issued (7 U.S.C. 2421). The information is held confidential until the certificate is issued (7 U.S.C. 2426).				
1. NAME OF APPLICANT(S)	2. TEMPORARY DESIGNATION OR EXPERIMENTAL NUMBER	3. VARIETY NAME			
NDSU Research Foundation	ND951394	'Beach'			
4. ADDRESS (Street and No., or R.F.D. No., City, State, and ZIP, and Country)	5. TELEPHONE (Include area code)	6. FAX (Include area code)			
C/O Executive Director 1735 NDSU Research Park Drive	(701) 231-8931	(701) 231-6661			
P.O. Box 5002 Fargo, ND 58105-5002	7. PVPO NUMBER	200 400			
8. Does the applicant own all rights to the variety? Mark an "X" in the	 e appropriate block. If no, please explai				
9. Is the applicant (individual or company) a U.S. national or a U.S. b	ased company? If no, give name of co	ountry. YES NO			
10. Is the applicant the original owner?	NO If no, please answer one	of the following:			
a. If the original rights to variety were owned by individual(s), is (are) the original owner(s) a U.S. Nationa				
		•			
b. If the original rights to variety were owned by a company(ies),	is (are) the original owner(s) a U.S. bas NO If no, give name of countr				
11. Additional explanation on ownership (Trace ownership from origin	nal breeder to current owner. Use the re	everse for extra space if needed):			
See additional Exhibit E - Statement of the Basis of the	ne Applicant's Ownership include	ed in the application.			
PLEASE NOTE:					
Plant variety protection can only be afforded to the owners (not licens	sees) who meet the following criteria:				
If the rights to the variety are owned by the original breeder, that penaltional of a country which affords similar protection to nationals of					
If the rights to the variety are owned by the company which employ nationals of a UPOV member country, or owned by nationals of a c genus and species.					
3. If the applicant is an owner who is not the original owner, both the	original owner and the applicant must m	eet one of the above criteria.			
The original breeder/owner may be the individual or company who dir Act for definitions.	rected the final breeding. See Section 4	1(a)(2) of the Plant Variety Protection			
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7,



19e. Exhibit E. Statement of the Basis of the Owner's Ownership

Dr. Michael S. McMullen, an employee of the North Dakota Agricultural Experiment Station and North Dakota State University, is a plant breeder who developed 'Beach' spring oat for which Plant Variety Protection is hereby sought. The employee by agreement and because of the condition of the use of facilities and funds of the North Dakota Agricultural Experiment Station and North Dakota State University has assigned all ownership rights to Beach oat to the North Dakota Agricultural Experiment Station and the North Dakota State University.

North Dakota State University on behalf of the North Dakota Agricultural Experiment Station has assigned all ownership to the NDSU Research Foundation. NDSU/RF is a nonprofit corporation set up to own and manage the intellectual property of North Dakota State University.

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> U.S. DEPARTMENT OF AGRICULTURE AGRICULTURAL MARKETING SERVICE SCIENCE AND TECHNOLOGY PLANT VARIETY PROTECTION OFFICE BELTSVILLE, MD 20705

EXHIBIT F DECLARATION REGARDING DEPOSIT

NAME OF OWNER (S) NDSU Research Foundation	ADDRESS (Street and No. or RD No., City, State, and Zip Code and Country) 1735 NDSU Research Park Drive	TEMPORARY OR EXPERIMENTAL DESIGNATION ND951394
	Fargo, ND 58105-5002	variety name 'Beach'
name of owner representative (s) Dale Zetocha Executive Director	ADDRESS (Street and No. or RD No., City, State, and Zip Code and Country) 1735 NDSU Research Park Drive Fargo, ND 58105-5002	PVPO NUMBER 200700044

I do hereby declare that during the life of the certificate a viable sample of propagating material of the subject variety will be deposited, and replenished as needed periodically, in a public repository in the United States in accordance with the regulations established by the Plant Variety Protection Office.

Signature	Date